CIO*Update*

June 9, 2000

IT Architecture

Message from the CIO

Information Technology Architecture

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Experience in industry and leading government organizations has demonstrated that effective design and employment of information technology (IT) systems requires a carefully-developed "blueprint" or architecture. This Information Technology Architecture (ITA) has several key objectives. First, the ITA defines the organization's key information needs and the cross-organization information flows necessary for efficient function. It also defines the relationship of information to the organization's critical functions and their supporting information systems. Finally, the ITA permits prioritization of IT development efforts while guiding developers to properly implement complex cross-organization information flows. The ultimate objective of an ITA is to better leverage IT to support achievement of the organization's strategic objectives. With IT investment averaging 10 percent of an organization's total resources, improving leverage of these resources is very important.

Developing an effective ITA requires a disciplined approach and a great deal of insight. It is not an easy task. In fact, many large organizations find the effort and discipline required to define an ITA so difficult that they fail to properly complete one. Federal Agencies, however, are required by the Clinger-Cohen Act of 1996 to develop an ITA and to use it in formulating the Agency's strategy for IT investments. Moreover, Congress and the Office of Management and Budget are increasingly emphasizing the requirement for an ITA as the basis for Agency budget requests. In future budget submissions, the ability to link budget requests to a sound ITA will be a necessity.

The DOE Information Architecture (IA) Program, led by Mike Tiemann, recently completed an initial version of the DOE Corporate Systems Information Architecture (CSIA) that focuses on streamlining and modernizing DOE corporate business systems and Departmentwide management functions. The CSIA provides the framework and requirements for developing solutions based on common business activities and data sharing, and it will be the point of departure for functional area and site-specific information architectures.

While the discussion above focused on information needs and information flows, the ITA also helps to establish IT standards to permit interoperability among systems implementing the architecture. The DOE IT Standards Program, under the direction of Carol Blackston, recently published the *IA Profile of Adopted Standards 2000*, reflecting IT standards in use throughout the Department and including newly added standards that address current initiatives such as Section 508 accessibility requirements. The Program is sponsoring a Departmental initiative to define a DOE Desktop Standardization Profile for the interchange of business information.

For those who have been closely following legislative initiatives, you are probably aware that in August 2000, Section 508 of the Rehabilitation Act will require Federal Agencies to ensure the accessibility of electronic information and technology to Federal employees and the general public, specifically to provide access to IT by persons with physical disabilities. In an effort to help speed implementation of Section 508 requirements, the General Services Administration has asked all Federal CIOs to appoint Agency IT Accessibility Coordinators. GSA has further requested that Agencies ensure the accessibility of key web sites by July 26, 2000. The Office of the CIO is moving proactively to work with DOE organizations to meet this deadline. continued to page 2

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DOE IA Program Delivers Corporate Architecture

The DOE Corporate Systems Information Architecture (CSIA) has been completed and ratified by representatives of the DOE programs and staff offices who participated in its creation. The CSIA supports modernization of corporate-level business systems, focusing on information needs such as budgeting, agreements, and personnel. The CSIA is the first time DOE has developed and come to consensus on a corporate picture of its business.

The project was sponsored by Deputy Secretary Glauthier and co-championed by the CIO and Director of Office of Science. Michael Tiemann of the CIO's Office was the project manager. He was joined by 14 Business Area Representatives (BARs) who developed the architecture working together as a team over a six month period. The team included: Curt Bolton, SC; Jim Colsh, NE; Bill Dorsey, EIA; Bob Franklin, MA; John Greenhill, SO/NN; Marc Hollander, NNSA/DP; Travis Hulsey, AS/ES; Paul Lewis, GC; Barbara Mandley, EE; John Panek, FE; Steve Simon, EH; Sandy Stiffman, WT; Leroy Valentine, CR; and Stephen Warren, EM. DynCorp provided Enterprise Architecture Planning methodology expertise.

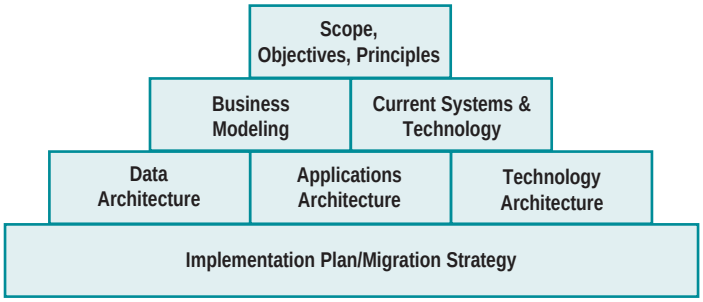
The CSIA provides a framework for information technology (IT) investment planning, a template to align major IT investments with the Department's strategic goals, and a strategy for implementation of a comprehensive set of modernized systems. This alignment can greatly strengthen DOE's budget position with OMB and Congress as it allows specific IT budget requests to be defended as integral, logical parts of an overall strategy. In creating the CSIA, the team discovered that a relatively small number of basic business functions define DOE's crosscutting and common business activities. Although programs and sites have different processes for performing the functions, the functions themselves are common to all and have the same basic information needs. This discovery supports a common approach to making corporate IT investment decisions through cooperation and consensus.

CSIA has established a vision for sharing corporate information and allowing data to be managed as a corporate asset. CSIA's corporate data management framework calls for core data to be created once and used many times, thus eliminating duplicative, inefficient data management practices. The applications architecture defines common, shareable corporate applications and repositories to minimize system redundancy. CSIA provides a methodology for prioritizing the applications development projects in establishing the implementation plan.

All new corporate IT projects should be derived from or assessed against this architecture, and all ongoing corporate projects will be aligned with the architecture. The next step is to present the CSIA to the Executive Committee for Information Management. For more information, contact Michael Tiemann (Telephone: 202-586-5461; email: michael.tiemann@hq.doe.gov) or visit the IA Program web site: http://cio.doe.gov/iap/.

The EAP Methodology

The DOE Information Architecture team employed Dr. Steven Spewak's Enterprise Architecture Planning (EAP) methodology in creating the Corporate Systems Information Architecture. The methodology offers a robust, formal process that brings together business and technical expertise to construct the series of components that result in a strategic information management plan. It also addresses the need for organizational buy-in via high-level championing and sponsorship.



Principles form the framework and fundamental tenets for making information management decisions. The Business Model defines the organization's business activities and is the basis of the planning process. Current Systems and Technology establishes the baseline 'as is' environment. The Data Architecture identifies the data entities associated with each business activity. The Applications Architecture describes the functionality, or applications, needed to conduct business in the "architected" environment, and the Technology Architecture provides the technical infrastructure to support the applications. The Implementation Plan serves as the road map to the future, scheduling the deployment of technology and applications functionality.

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The Cyber Security team is nearing the completion of reviews of site Cyber Security Program Plans (CSPPs). In addition, the DOE Cyber Security Architecture (CSA) is being refined with the help of an architecture working group, representing the Department's major missions. The CSA, which is to be published this summer, will provide guidelines for DOE organizations to help determine appropriate security implementations consistent with the types of information, missions, and unique requirements within each organization. The next issue of CIO Update will focus on the details of the Department's cyber security initiatives.

IT Standards for the New Millennium

Carol Blackston, Manager of the DOE IT Standards Program, advocates for interoperability via her Program's participation in Departmental and Federal initiatives.

The DOE IT Standards Program recently published the *Information Architecture Profile of Adopted Standards 2000*, updating the existing Profile compiled in 1997. The Profile describes IT standards approved and in use in the Department. The IT Standards Program, directed by Carol Blackston, performed a sunset review of standards in late 1999, conducting research and seeking advice from subject matter experts throughout the Department. The Profile, which supports compliance with the Clinger-Cohen Act of 1996, reflects Departmentwide input and consensus on IT standards.

The updated Profile includes 21 new standards that reflect the Department's evolutionary computing practices. The Department's cyber security initiative follows the Common Criteria standard, which provides a common, world-wide catalog of security functionality. Conformance to Section 508 of the Rehabilitation Act will be facilitated by the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines 1.0. The addition of the Extensible Markup Language (XML) positions the Department to take advantage of this emerging technology that has the potential to revolutionize web-based information management. The IT Standards Program is participating in the Federal CIO Council's initiative to promote Federal use of XML. The addition of Energy Star® reflects the Department's commitment to energy efficient and environmentally sound computing practices.

The DOE IT Standards Program is currently forming a Desktop Standards Focus Group to define the direction the Department should take in establishing a DOE Desktop Standardization Profile for the interchange of business information. The DOE IT Standards Program is an important component of the Department's Information Architecture Program, helping to ensure interoperability by maintaining a Profile of Adopted IT Standards and Technical Reference Model of information services. For more information, contact Carol Blackston (Telephone: 301-903-4294; email: carol.blackston@hq.doe.gov) or visit the IT Standards web site (www-it.hr.doe.gov/standards/).

CITIS: Phase 2

The Common Information Technology Infrastructure Services (CITIS) Pilot Program is entering the services modernization phase, which will run from June 1, 2000 thru the end of February 2001. This phase will employ the latest commercial industry IT business practices and enabling technology to optimize the Department's operating efficiency and enhance IT support operations.

Modernization services and technologies will include: secure corporate and local network infrastructure services for enterprise networking; enterprise systems management of core IT infrastructure components via the Infrastructure Support Center; improved corporate messaging coordination and collaboration services; a standardized desktop environment to support business computing; global single sign-on between multiple application platforms; more secure web infrastructure; interactive multimedia and collaborative services to enable virtual communities; integrated voice and data services; improved Help Desk User Support Center for network service restoration; web-enabled corporate systems for building an e-business platform.

Prior to deployment, all Pilot Program services and technologies will be tested in the DOE Test and Integration Laboratory. End users will be offered training on the standardized office applications. The CITIS Pilot Program will develop a technology infrastructure architecture framework capable of supporting future modernization efforts. The Pilot targets approximately 2,500 end users throughout MA, CR, and SO organizations.

OMB A-130: Revisions

Office of Management and Budget Circular A-130, *Management of Federal Information Resources,* is being revised to strengthen requirements for performance- and results-based management of Federal IT resources and to incorporate provisions of the Clinger-Cohen Act; the Government Performance and Results Act; the Government Paperwork Elimination Act; and Executive Order 13011, *Federal Information Technology.*

Agencies are to appoint a CIO who reports directly to the Agency head and to establish and maintain a capital planning and investment control process. The revised Circular defines minimum criteria for an Agency Information Technology Architecture and reinforces requirements of the Paperwork Elimination Act. By October 21, 2003, Agencies are to provide the option of electronic maintenance, submission, or disclosure of information, as a substitute for paper.

BMIS-FM: Vision for DOE Financial Management

Project Manager Michael B. Fraser-- "We will need sustained hard work and help from many DOE staff and contractors to ensure a successful transition to BMIS-FM. Active participation and feedback will be a key success factor."

The BMIS-FM (Business Management Information System-Financial Management) Project is creating an enterprise-level vision for the Department's financial management functions, replacing and expanding the current functionality of the Department's primary accounting, funds control, and management reporting systems. This effort entails replacing or updating legacy systems, software, and hardware platforms to eliminate 'stove-piped' systems that cannot share data or participate in integrated functionality. The redesigned core financial system will feature integrated, modular solutions and updated management techniques to support business and operations management, as well as reporting to central management agencies, Congress, and the public. It will be user-centered with an emphasis on ease of use. BMIS-FM supports emerging requirements for the DOE CSIA (see page 2) and security under Federal Information Processing Standard 140-1, *Security Requirements for Cryptographic Modules.* Its additional functionality will help DOE meet performance measurement criteria of the Government Performance and Results Act.

According to project manager Michael B. Fraser, BMIS-FM has one of the most complex sets of requirements he has experienced, but he can envision the end result of the modernization effort where BMIS-FM will itself be part of an Enterprise Resource Planning (ERP) solution offering potential future functionality to support such areas as budget formulation, project management, inventory, and procurement. The ERP will be integrated with the Corporate Human Resource Information System, the Executive Information System, and U.S. Treasury Systems. The timing and choice of the next ERP modules will be determined later in the project. For more information, contact Michael B. Fraser (Telephone: 301-903-1428) or visit the BMIS-FM web site (.cr.doe.gov/bmis).

Accessibility: Effective August 2000

In August 2000, Section 508 of the Rehabilitation Act (Public Law 105-220, Section 508) becomes effective, imposing strict requirements to make Federal electronic and information technology accessible to Federal employees and the public, especially the disabled. The law applies when Federal Agencies develop, procure, maintain, or use electronic and information technology. It includes, but is not limited to, computer hardware, software, accessible data such as web pages, facsimile machines, copiers, and telephones (www.usdoj.gov/crt/508/508home.html).

Section 508 tasks the Access Board (www.access-board.gov/) with developing standards for disseminating information, including the world wide web. The standards define what technologies are covered and lay out the minimum level of access required, addressing technical criteria as well as performance-based requirements and compatibility with adaptive equipment used by the disabled. A May 8, 1999 General Services Administration (GSA) memorandum requested all Federal CIOs to appoint Agency IT Accessibility Coordinators by May 19, 2000. OCIO's Coordinator is Ethan Weiner (Telephone: 202-586-6037; email: ethan.weiner@hq.doe.gov). GSA is asking that each Agency's principal and top 20 web sites (by volume of use) be made accessible by July 26, 2000, the 10th anniversary of the Americans With Disabilities Act.

GSA's Federal IT Accessibility Initiative, responsible for Governmentwide coordination of Section 508 implementation, is offering free technical training for Federal webmasters on making web pages accessible. Contact Christine Frazier (telephone: 202-501-4906) for more information.

Standards and guidelines are available to help make web sites accessible. The DOE IA Profile of Adopted Standards 2000 (www-it.hr.doe.gov/standards/) includes the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines 1.0 (www.w3.org/WAI/). The W3C provides a checklist to determine a web site's accessibility (www.w3.org/tr/wai-webcontent-techs). The "Bobby" site provides a service to check web site compliance with W3C guidelines (www.cast.org/bobby). The National Institute of Standards and Technology (NIST) is fast tracking a standard for a *Common Industry Format for Industry Usability Reporting* (http://zing.ncsl.nist.gov/iusr/) to ensure commercial software conformance with Section 508.